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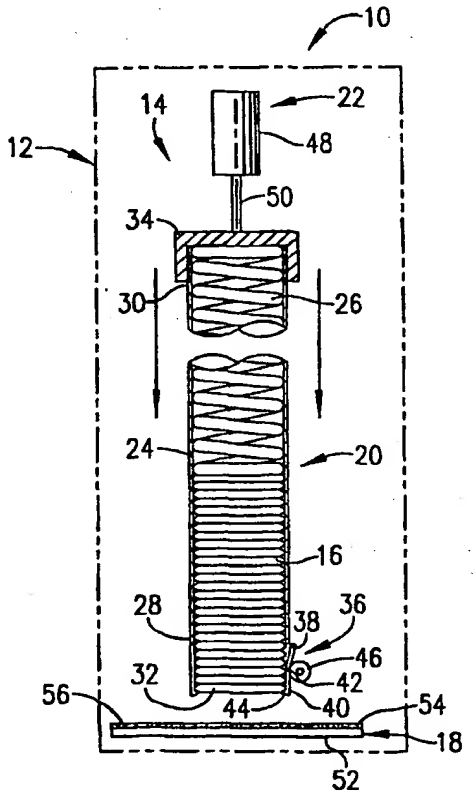
(54) Title: DEVICE FOR PRODUCTS WITH LABELS

(57) Abstract

A label apparatus (10) includes a labeler (12) and an applicator (14) configured to store a plurality of RFIDs (16) and operable to apply said RFIDs (16) to labels (18) during dispensing from the labeler (12). The preferred label apparatus (10) includes an applicator (14), which can be located inside the labeler (12) or be free standing, with a spring loaded magazine which stores RFIDs (16) and selectively applies a small, flexible RFID (16) to adhesive (56) on the back side (54) of a label (18) such that the label (18) with the RFID (18) may be attached to a product (58) inconspicuously.



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DEVICE FOR PRODUCTS WITH LABELS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to the field of labelers. More particularly, the invention is concerned with a labeler coupled with an applicator that stores and applies radio frequency identification transponders (RFIDs) to labels for use in conjunction with detectors operable to detect unauthorized removal of labeled items.

2. Description of the Prior Art

One example of a prior art labeler is a HOBART pressure- sensitive, thermal label machine often found in supermarket delicatessen and meat and seafood counters. Information is keyed into the labeler and a label is printed, dispensed and applied to the product wrapper. These types of products are often high value products making them more subject to shoplifting. RFIDs have been used in the prior art to deter shoplifting, but the RFID may be placed conspicuously such that the device itself may be easily removed. For some products, the cost of applying an anti-shoplifting device may not be a cost effective method of reducing the shoplifting of that product. Another common problem is that the application of any anti-shoplifting device to a product is time-consuming or inconvenient, especially in a fast paced setting such as a delicatessen.

SUMMARY OF THE INVENTION

The present invention solves the prior art problems mentioned above and provides a distinct advance in the state of the art. In particular, the combination labeler apparatus hereof is effective for applying RFIDs to products in a manner which is inconspicuous, quick, selective and convenient.

The preferred labeler apparatus of the present invention includes a labeler and an applicator configured to store a plurality of RFIDs and selectively apply these RFIDs to labels that are dispensed from the labeler. The applicator is a spring loaded magazine or cartridge which applies the RFIDs one at a time to respective labels. The RFIDs are applied to the adhesive side of the label so that when the combination label and RFID are placed on a product, the disk will not be visible from the face of the label. It is also preferred that the application of RFIDs can be selective, that is, an RFID is not applied to every label. This selective application may be controlled by a computer processor

that determines which product labels should have RFIDs applied or it may be controlled by the labeler operator. Determination of which products receive labels with RFIDs may be done randomly or on the basis of price, size, or tendency to be shoplifted.

The applicator itself may be located inside the labeler or adjacent the labeler. Alternatively, the applicator may be produced as a kit designed to retrofit existing labelers or labelers produced without the applicator. This kit may include a linking structure configured to physically link the applicator to the labeler or it may be free standing.

In preferred forms, the RFID is small, flexible and detectible by detectors located near the exits and past the checkout counters. RFIDs can be deactivated by passing them by a scanner. RFIDs, which are not deactivated yet moved past the detectors will trigger an alarm.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a schematic representation of the preferred labeler apparatus in accordance with the present invention prior to application of an RFID to a label;

Fig. 2 is a schematic view similar to Fig. 1 but showing an RFID being applied to the adhesive side of a label;

Fig. 3 is a pictoral view of an RFID applied to the adhesive side of a label; and

Fig. 4 is a pictoral view of a label attached to an object with an RFID attached to the adhesive side of the label.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The drawing figures illustrate preferred label apparatus 10 in accordance with the present invention. Referring initially to Figs. 1 and 2, label apparatus 10 includes conventional labeler 12 and applicator 14. Conventional labeler 12, such as a Hobart thermal labeler preferably dispenses pressure sensitive adhesive labels. Applicator 14 is configured to apply radio frequency identification transponders (RFIDs) 16 to conventional labels 18 and includes storage assembly 20 and actuator 22.

RFIDs 16 are preferably small, thin and flexible so as to fit under conventional labels 18 and flexibly conform to the products to which they are applied. RFIDS 16 such as IDT 102 passive transponder disks by IDTAG are examples of preferred RFIDS 16.

Storage assembly 20, preferably a spring loaded magazine, is configured to store a plurality of RFIDs 16 and includes tubular housing 24, spring 26, and retaining clip 28. Housing 24 is shiftable between a retracted position (Fig. 1) and an applicator

position (Fig. 2) and encloses the plurality of RFIDs 16, and also encloses spring 26. RFIDs 16 are preferably arranged in a stacked configuration between an applicator end 28 and an opposed end 30, with an endmost RFID 32 adjacent applicator end 28. Opposed end 30 terminates in removable endcap 34. Removable endcap 34 is connected to spring 26 and can be removed from housing 24 in order to load more RFIDs 16 when desired. Spring 26 biases RFIDs 16 toward applicator end 28.

Retaining clip 36 is preferably substantially rigid, presents a generally V-shaped configuration, and includes first leg 38 and second leg 40 with juncture 42 therebetween. Clip 36 is shiftable between a retaining position (Fig. 1) and a releasing position (Fig. 2) by pivoting at juncture 42 in response to shifting of housing 24 between the applicator position and the retracted position. Second leg 40 includes retaining member 44 configured to retain endmost RFID 34 when housing 24 is in the retracted position and when clip 36 is in the retaining position. Member 44 shifts and releases endmost RFID 34 when housing 24 shifts to the applicator position and clip 36 shifts to the releasing position.

Roller 46 is coupled with the labeler 12 and rollably engages the outboard face of clip 36 and is operable to alternately engage first leg 38 and second leg 40 by rolling in response to the shifting of housing 24. Shifting of the housing 24 causes roller 48 to roll along outboard face of clip 36 and alternately engage first leg 38 and second leg 40. When housing 24 is in the retracted position, roller 46 engages second leg 40 and clip 36 is held in a retaining position allowing member 44 to secure endmost RFID 36. When housing 24 is in the applicator position, roller 46 engages first leg 38 and clip 36 shifts to a retaining position shifting member 44 away from the applicator end 28 and releasing endmost RFID 36.

Actuator 22 includes conventional solenoid 48 and axially shiftable rod 50. Operation of labeler 12 triggers solenoid 48 and axial shifting of rod 50. Rod 50 is coupled with solenoid 48 and endcap 34 of housing 24 and is axially shifted in response to actuation by solenoid 48. As illustrated in Fig. 2, when actuator 22 is actuated, the extension of rod 50 increases in order to push housing 24 downwardly from the retracted position toward the applicator position and toward label 18. As housing 24 returns from an applicator position to a retracted position, rod 50 retracts into solenoid 48 and pulls housing 24 back to the retracted position as illustrated in Fig. 1.

Fig. 3 illustrates conventional label 18 which includes front face 52 and back face 54 having adhesive 56 thereon that holds an RFID 16 after application. Fig. 4 illustrates a label 18 in accordance with the present invention applied to a product 58.

Label front face 52 includes while back face 54 includes RFID 16 and adhesive 56 which adheres RFID 16 to label 18 and label 18 to product 58.

The present invention may be in the form of a retrofit kit designed to convert a labeler to one operable to apply RFIDs 16 to labels 18. The preferred kit includes applicator 14 having storage assembly 20 configured to store a plurality of RFIDs 16 and actuator 22 operable to actuate said storage assembly 20 and roller 46. The kit would also include appropriate hardware for coupling with the labeler.

In operation, labeler 12 positions labels 18 for RFID 16 application. Actuator 22, when activated by solenoid 48, axially shifts rod 50 which in turn shifts housing 24 from a retracted position toward label 18 to an applicator position.

Roller 46 is rollably engaged with clip 36 but remains in a fixed position relative to the labeler 12. Shifting of the housing 24 causes roller 46 to roll along the outboard face of clip 36 and pivot clip 36 from a retaining position to a releasing position as housing 24 shifts toward the applicator position and toward label 18. When roller 46 engages first leg 38, clip 36 is pivoted from a retaining position to a releasing position. Shifting of clip 36 from retaining position to releasing position shifts member 44 away from applicator end 28 such that it no longer retains endmost RFID at applicator end 28.

Actuator 22 then operates to retract housing 24. As housing 24 is retracting, roller 46 rotates and engages first leg 38 which pivots clip 36 from the releasing position to the retaining position. As clip 36 is shifting into the retaining position, member 44 shifts toward applicator end 28, once again operating to retain the new endmost RFID 32 which has moved into position at applicator end 28 after the previous endmost RFID 32 is applied to label 18. This secures the RFID 16 which has moved into position as the new endmost RFID 32 at the applicator end 28 and is in position to be applied to the next label 18. The label 18 which now includes an RFID 16 on its back side 54 may now be dispensed and applied to a product 58.

Preferred label 18, including an RFID 16 adhered to the adhesive 56 on the back side 54 of the label 18 and sandwiched between the label 18 and the product 58, allows stores to monitor and detect unauthorized removal of product 58 from stores. Monitoring and detection of RFIDs 16 removed without authorization is done in cooperation with detectors which are preferably placed near the exits of stores. Deactivated RFIDs 16 do not trigger the detectors while RFIDs 16 that are not deactivated do trigger the detectors. RFIDs 16 are normally deactivated when scanned at the checkout counters of a store. When an RFID 16 that has not been deactivated passes by a detector, a signal is emitted from the detectors. This signal may be an

audible noise or a silent signal directed to security guards or loss prevention specialists, alerting them to the unauthorized product 58 removal. Thus, use of the label 18 in cooperation with the RFID 16 may prevent current unauthorized removal and deter future unauthorized removal by making it harder to remove these products 58 from a store without authorization.

Those skilled in the art will now appreciate that the present invention solves the problems of the prior art mentioned above. The label apparatus 10 of the present invention enables labeling of products with an RFID 16 affixed to a label 18. In addition, the present invention provides a new combination of a label 18 with and RFID 16 that is inconspicuous, difficult to remove without destroying the label 18, inexpensive, convenient and able to alert unauthorized removal of products 58 from stores. The small size and flexibility of the RFID 16 allow it to be placed inconspicuously under even small labels 18 and conform to products 58 of different shapes to which the label 18 is applied. To maximize cost effectiveness, the RFIDs 16 may be selectively applied to labels 18. This selective application may be controlled by the label machine operator or a computer program which randomly attaches RFIDs 16 to labels 18 during dispensing or which applies RFIDs 16 to labels 18 on the basis of price, size, tendency to be shoplifted or other predetermined criteria. In this way, labels 18 with RFIDS 16 may be attached to products 58 that were previously not monitorable in this manner. For example, high value items such as steaks, sliced meats, cheeses, seafood, etc. that are sold in places like supermarket deli's and relatively easy to conceal may now be labeled with labels 18 connected with RFIDs 16 to reduce or prevent their being shoplifted. Furthermore, the kit of the present invention will allow currently existing labelers as well as labelers manufactured without an RFID 16 applicator to be retrofitted in order to produce labels 18 that include RFIDs 16.

Those skilled in the art will also appreciate that the present invention encompasses many variations in the preferred embodiments described herein. For example, the labeler 12 may include labelers other than the preferred HOBART pressure sensitive thermal label machine and the applicator 14 may be any device which can be configured to apply RFIDs 16 to labels 18 including a spring loaded magazine, a rotary magazine, or a gas charged magazine. The selective application of RFIDs 16 to labels 18 may be controlled by a computer program or the label apparatus 10 operator. The application of RFIDs 16 to labels 18 may occur before, during, or after dispensing and before, during, or after printing. Furthermore, the resulting labels 18 may be applied to any product 58. Having thus described those embodiments, the following is claimed as new and desired to be secured by Letters Patent:

Claims:

1. A label apparatus comprising:

a labeler operable to dispense labels; and

an applicator coupled with said labeler including an actuator and a storage assembly, said storage assembly being configured to store a plurality of radio frequency identification transponders (RFIDs) and operable upon actuation to apply said RFIDs to respective labels during dispensing from said labeler and said actuator being coupled with said storage assembly and operable to actuate selectively said storage assembly.

2. The apparatus of claim 1, said actuator being operable to actuate said storage assembly in response to dispensing of labels by said labeler.

3. The apparatus of claim 1, said actuator being operable to actuate said storage assembly in response to printing of said labels by said labeler.

4. The apparatus of claim 1, said actuator being operable to actuate said storage assembly in response to positioning of said label under said applicator.

5. The apparatus of claim 1, said RFIDs including flexible, passive transponder disks being operable to substantially conform to the shape of a product.

6. The apparatus of claim 1, said storage assembly including a spring-loaded tubular magazine axially shiftable between a retracted position and an applicator position, and said actuator being operable to shift selectively said magazine.

7. The apparatus of claim 6, said actuator including a solenoid and an axially shiftable rod coupled with said magazine.

8. The apparatus of claim 6, said magazine including a tubular housing, a retaining clip, an applicator end, an opposed end opposite said applicator end and an endcap,

said magazine being configured to store a plurality of RFIDs in a stacked relationship between said ends with an endmost RFID adjacent said applicator end,

said retaining clip presenting a generally V-shaped configuration having a first leg and a second leg with a juncture therebetween,

said second leg including a retaining member extending from the distal end operable to releasably secure said endmost RFID at said applicator end, and

said clip being pivotally coupled with said tubular housing at said juncture and shiftable between a retaining position in which said retaining member engages and retains the endmost RFID adjacent said applicator end and a releasing position in which said retaining member is shifted away from said applicator end allowing dispensing of the endmost RFID.

9. The apparatus of claim 8, said magazine being configured so that the endmost RFID engages and adheres to the adhesive face of a label during dispensing when said magazine is in the applicator position.

10. The apparatus of claim 8, said retaining clip operable to release said endmost RFID when in the releasing position.

11. The apparatus of claim 8, said clip being shifted into said retaining position in response to said magazine being actuated into said applicator position.

12. The apparatus of claim 11, said applicator including a roller positioned to engage rollably the outboard face of said clip alternately engaging said first and second legs in order to pivot said clip during actuation between said releasing and said retaining positions.

13. The apparatus of claim 1, said labeler including a thermal labeler and said labels including pressure sensitive adhesive labels having a front side and a back side, said back side including adhesive.

14. The apparatus of claim 13, said storage assembly being operable to apply said RFIDs on the adhesive side of said labels.

15. A method of labeling products using a labeler operable to dispense a label from a source thereof comprising:

(a) storing a plurality of RFIDs in a storage assembly of an applicator, said storage assembly being shiftable between a retracted position and an applicator position and including a housing having an applicator end and an opposed end, an endmost RFID located at said applicator end of said storage assembly and engagable with the adhesive side of a label when said storage assembly is in said applicator position, a spring inside said housing and biased against the plurality of RFIDs, and a pivotable retaining clip located adjacent said applicator end and shiftable between a retaining position and a releasing position in response to shifting of said storage assembly, said retaining clip including a retaining member at the distal end thereof being operable to retain said endmost RFID when said clip is in said retaining position and release said endmost RFID when said clip is in said releasing position;

(b) shifting said storage assembly from said retracted position to said applicator position;

(c) shifting said clip from said retaining position to said releasing position;

(d) engaging said endmost RFID with the label;

(e) releasing said endmost RFID when it engages the label;

(f) shifting said storage assembly from said applicator position to said retracted position;

(g) shifting said clip from said releasing position to said retaining position;

(h) dispensing the label; and

(i) affixing the label to a product.

16. The method of claim 15, step (b) further comprising the step of actuating an actuator, said actuator including an axially shiftable rod coupled with said storage assembly and operable to shift said storage assembly from a retracted position to an extended position.

17. The method of claim 15, said clip presenting a generally V-shaped configuration having a first leg and a second leg with a juncture therebetween, said second leg member including a retaining member extending from the distal end, said clip coupled with a roller positioned to engage rollably the outboard face of said clip alternately engaging said first and second leg members in order to pivot said clip during shifting between said retaining position and said releasing position, step (c) further comprising the step of engaging rollably said first leg of said clip with said roller.

18. The method of claim 17, step (g) further comprising the step of engaging rollably said second leg of said clip with said roller.

19. A kit configured to convert labelers to labelers operable to apply RFIDs to labels during dispensing from said labelers comprising:

an applicator including a storage assembly having an applicator end and an opposed end, configured to store a plurality of RFIDs, and operable to apply said RFIDs to labels during dispensing from said labeler,

an actuator being operable to actuate said storage assembly, and

a roller.

20. The kit of claim 19, said kit further comprising a linking structure configured to connect said applicator to said labeler.

21. The kit of claim 19, said applicator being configured to fit inside said labeler.

22. The kit of claim 19, said applicator being controlled by a computer program.

23. The kit of claim 19, said applicator including:

a spring loaded magazine configured to store a plurality of RFIDs and operable to apply said RFIDs to labels during dispensing from said labeler;

a spring inside said magazine and biased against said plurality of RFIDs;

an endcap at said opposed end coupled with said spring;

an endmost RFID located adjacent said applicator end;

a shiftable retaining clip operable to pivot between a retaining position and a releasing position, said clip operable to retain said endmost RFID at said applicator end when in said retaining position and release said endmost RFID when in said releasing position; and

a roller coupled with said clip and operable to shift said retaining clip.

24. The kit of claim 23, said clip presenting a generally V-shaped configuration having a first leg and a second leg with a juncture therebetween, said second leg including a retaining member extending from the distal end and operable to retain said endmost RFID when said clip is in said retaining position and said roller operable to shift said clip by alternately rollably engaging said first and second legs of said clip, said first leg being engaged when said clip is in said releasing position and said second leg being engaged when said clip is in said retaining position.

25. In a labeler operable to dispense labels, said labeler including:

an applicator including a solenoid coupled with an axially shiftable rod and operable to activate said applicator;

a storage assembly shiftable between an applicator position and a retracted position and including:

a housing having an applicator end and an opposed end operable to store a plurality of RFIDs;

an endmost RFID adjacent said applicator end and engagable with a label when said storage assembly is in said applicator position;

a spring inside said storage assembly biased against said plurality of RFIDs operable to provide a biasing force directed from said opposed end toward said applicator end;

a pivotable retaining clip presenting a generally V-shaped configuration having a first leg and a second leg with a juncture therebetween, said second leg including a retaining member extending from the distal end and said clip being operable to shift between a retaining position and a releasing position, and said member retaining said endmost RFID at said applicator end against said spring bias when said clip is shifted into said retaining position and said member releasing said endmost RFID when said clip is shifted into said releasing position; and

a roller engaged rollably with said clip and operable to pivot said retaining clip in response to shifting of said applicator by alternately engaging said first and second legs,

a method of coupling an RFID with a label comprising:

(a) activating said applicator with said solenoid;

(b) shifting said storage assembly from a retracted position to an applicator position;

(c) engaging a label with said endmost RFID;

(d) pivoting said retaining clip with said roller from a retaining position to a releasing position;

(e) releasing said endmost RFID when said endmost RFID engages said adhesive side of a label;

(f) shifting said storage assembly from an applicator position to a retracted position; and

(g) pivoting said retaining clip with said roller from a releasing position to a retaining position.

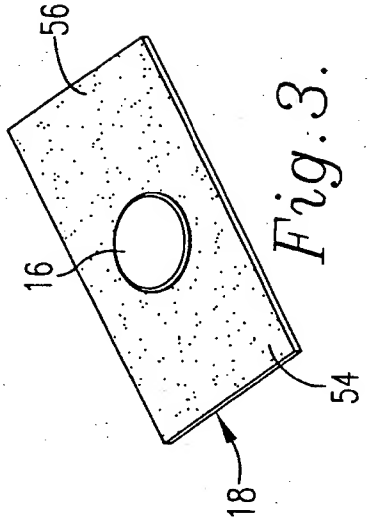

Fig. 3.

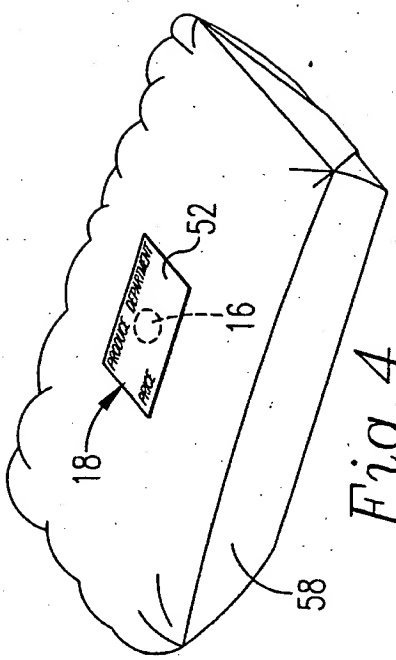

Fig. 4.

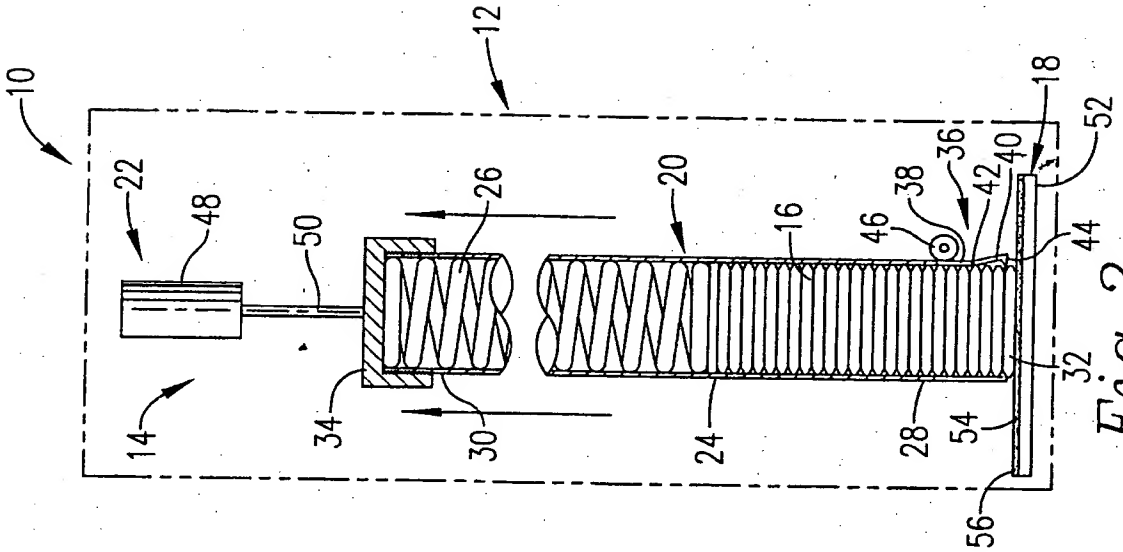

Fig. 2.

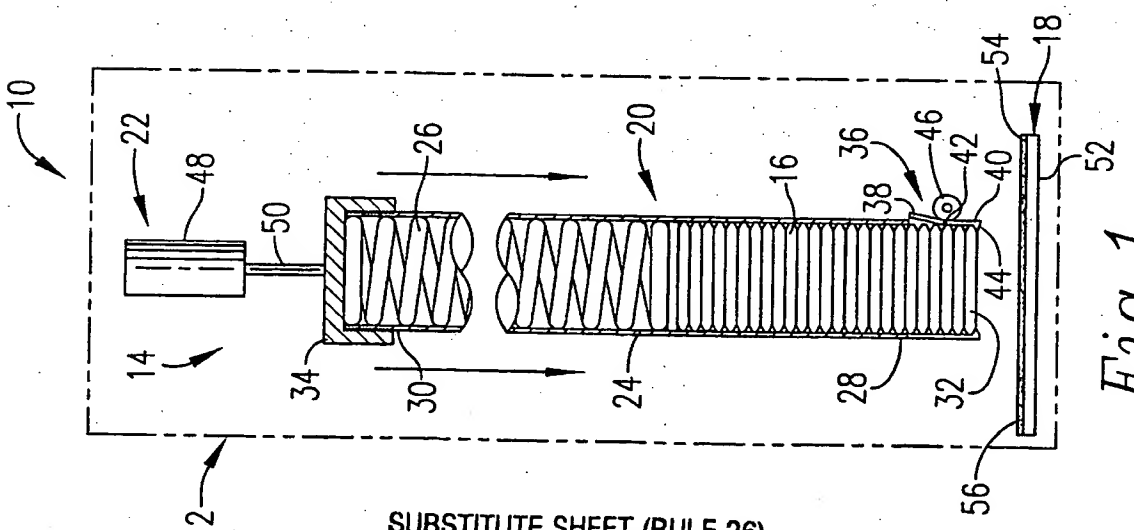

Fig. 1.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/20522

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : B32B 31/00; B65C 9/10
US CL : 156/64, 573, 360
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 156/64, 573, 360, DIG. 29, DIG. 30, 363, 364; 221/12, 74, 82,83,190, 289, 297; 283/82, 83; 340/572

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,867,102 A (SOUDER et al) 2 February 1999, Fig. 12.	1, 4, 5
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Y		2, 3, 6-25
Y	US 5,413,651 A (OTRUBA) 9 May 1995, Fig. 1.	1-25
Y	US 3,998,238 A (NIGRO) 21 December 1976, Fig. 1, 2, 3, 4, 5, 6, 7.	6-25
Y	US 4,784,714 A (SHIBATA) 15 November 1988, col. 4, lines 53-62.	13, 14

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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